

5 CLAIMS

1. An interleaver for a turbo encoder and decoder comprising a first table populated with a first set of parameters to allow intra-row permutation of data within an array in accordance with a first wireless communication standard when operation in the first wireless communication standard is required and a second table populated with a second set of parameters to allow inter-row permutation of the data in accordance with the first wireless communication standard when operation in the first wireless communication standard is required wherein the first table is populated with a third set of parameters to allow intra-row permutation of data within an array in accordance with a second wireless communication standard when operation in the second wireless communication standard is required and to populate the second table with a fourth set of parameters to allow inter-row permutation of the data in accordance with the second wireless communication standard when operation in the second wireless communication standard is required.

2. An interleaver according to claim 1, wherein the first wireless communication standard is the family of WCDMA standards within 3GPP.

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3. An interleaver according to claim 1 or 2, wherein the second wireless communication standard is the family of WCDMA standards within 3GPP2.

4. An interleaver according to claim 3, wherein the parameters populated in the first table are $(Rj)mod(p')$, where j is the row number for the data array, Rj is a row specific prime number for the array and p' corresponds to a

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5 selected prime number minus 1 for the 3GPP standard and the total number
of columns within the data array for 3GPP2.

10 5. An interleaver according to any preceding claim, wherein the parameters
populated in the second table are inter-row permutation sequences
multiplied by column numbers associated with the data array.

15 6. An interleaver according to claim 4, further comprising a multiply and
modulo module arranged to receive $(R_j) \text{mod}(p')$ values from the first table
and to generate and output via a first output $[ixR_j] \text{mod}(p')$ where i
corresponds to the columns of the data array.

20 7. An interleaver according to claim 6, wherein the multiply and modulo
module is arranged to generate and output via a second output
 $[ixR_j] \text{mod}(p')$ when operating in the the family of WCDMA standards within
3GPP2.

25 8. An interleaver according to any preceding claim, further comprising a buffer
arranged to compare received interleaved addresses with the size of the
data array and to store valid addresses.

30 9. An interleaver according to claim 8, wherein the buffer is arranged to control
the flow of data into the interleaver, such that when a predetermined
number of addresses have been stored in the buffer the buffer stops the
flow of data into the interleaver to allow the outputting of addresses from the
buffer to be performed at substantially a constant rate.

5 10. A turbo decoder comprising an interleaver according to any preceding claim
 and a processor arranged to populate the first table and second table with
 the first set of parameters and the second set of parameters respectively
 when operation in the first wireless communication standard is required and
 to populate the first table and the second table with the third set of
10 parameters and the fourth set of parameters respectively when operation in
 the second communication standard is required.

15 11. A turbo encoder comprising an interleaver according to claims 1 to 9 and a
 processor arranged to populate the first table and second table with the first
 set of parameters and the second set of parameters respectively when
 operation in the first wireless communication standard is required and to
 populate the first table and the second table with the third set of parameters
 and the fourth set of parameters respectively when operation in the second
 communication standard is required.

20 12. A method for interleaving in a turbo encoder and decoder comprising
 populating a first table with a first set of parameters to allow intra-row
 permutation of data within an array in accordance with a first wireless
 communication standard when operation in the first wireless communication
25 standard is required and populating a second table with a second set of
 parameters to allow inter-row permutation of the data in accordance with
 the first wireless communication standard when operation in the first
 wireless communication standard is required and populating the first table
 with a third set of parameters to allow intra-row permutation of data within
30 an array in accordance with a second wireless communication standard
 when operation in the second wireless communication standard is required
 and populating the second table with a fourth set of parameters to allow
 inter-row permutation of the data in accordance with the second wireless
 communication standard when operation in the second wireless
35 communication standard is required.